

IN THE UNITED STATES COURT OF FEDERAL CLAIMS

SCIENCE APPLICATIONS  
INTERNATIONAL CORP.,

*Plaintiff,*

v.

THE UNITED STATES,

*Defendant,*

and

MICROSOFT CORPORATION,

*Defendant-Intervenor,*

L3 TECHNOLOGIES, INC.,

*Third-Party Defendant.*

No. 17-825 C

Judge Eleni M. Roumel

**L3 TECHNOLOGIES, INC.'S OPENING CLAIM CONSTRUCTION BRIEF**

Dated: October 30, 2020

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## **I. INTRODUCTION**

Pursuant to this Court's Amended Scheduling Order (ECF No. 141), Third-Party Defendant L3 Technologies, Inc. ("L3") hereby provides its Opening Claim Construction Brief for U.S. Patent No. 7,787,012 (" '012 patent"), U.S. Patent No. 8,817,103 (" '103 patent"), U.S. Patent No. 9,229,230 (" '230 patent"), and U.S. Patent No. 9,618,752 (" '752 patent") (ECF No. 1, Exs. A–D). In accordance with the Court's order:

- L3 proposes constructions for three new terms which the parties have not previously construed: (a) "Overlay" (b) "a heads up display adapted for viewing of the visual field by a user of the system wherein the HUD comprises a transparent display" and (c) "based on a comparison of data from the first and second video source images."
- L3 proposes a new construction for a fourth term which SAIC and the Government identified and construed: "a transparent display overlaying the visual field." Because this term is similar to term (b) above, they will be briefed together.
- L3 also provides a short discussion of why it agrees with the positions previously advanced by Defendants with regard to the terms "video images," "video source," and "registration."

L3 believes that each of these terms may prove critical to issues of non-infringement or invalidity of one or more claims of the asserted patents. Further, with respect to any other claim term that the parties have previously requested the Court to construe, L3 agrees with the positions advanced by the government with respect to those terms.

## **II. LEGAL PRINCIPLES OF CLAIM CONSTRUCTION**

"It is a 'bedrock principle' of patent law that the 'claims of a patent define the invention to which the patentee is entitled the right to exclude.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc). The claims do not stand alone; they "must be read in view of

the specification, of which they are a part.” *Phillips*, 415 F.3d at 1315 (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996)). “[T]he specification is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Phillips*, 415 F.3d at 1315. After reading the claims in view of the specification, the Court should consider the prosecution history. The prosecution history “can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it otherwise should be.” *Phillips*, 415 F.3d at 1317.

Claims limitations are “given their ordinary and customary meaning” as understood by “a person of ordinary skill in the art in question at the time of the invention,” not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.* at 1312-13 (internal citations omitted).<sup>1</sup> Although intrinsic evidence is the most important evidence in claim construction, courts are also authorized to rely on extrinsic evidence, which “consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises.” *Id.* at 1317.

### **III. BACKGROUND OF THE ASSERTED PATENTS**

The asserted patents have been described in detail in the government’s opening claim construction brief (ECF No. 89, pp. 1-9) and will only be briefly summarized here. The ’012 and

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<sup>1</sup> L3 agrees with the government that a person of ordinary skill in the art, for the asserted patents, possesses a Bachelor of Science degree in Computer Science and three years of experience in programming video/graphics applications and computer vision, or alternatively, a Master of Science degree in Computer Science and one year of experience in programming video/graphics applications and computer vision. Defendant United States’ Opening Claim Construction Brief, pp 14-15 (ECF No. 89).

the '103 patents are part of the same patent family and share the same named inventors and the same specification and drawings. The '012 patent family generally claims systems and methods for overlaying video images onto a transparent display, through which the user can see both the video image and the underlying visual field. For example, the video image can be from a thermal weapon sight mounted on a weapon, and the transparent display can be associated with night vision goggles. Adjustments to the orientation of the video image with respect to the visual field is accomplished using orientation sensors mounted on both the video image source and the transparent display. *See, e.g.*, '012 patent, claims 1, 17, Figs 4 and 6; '103 patent, claim 1.

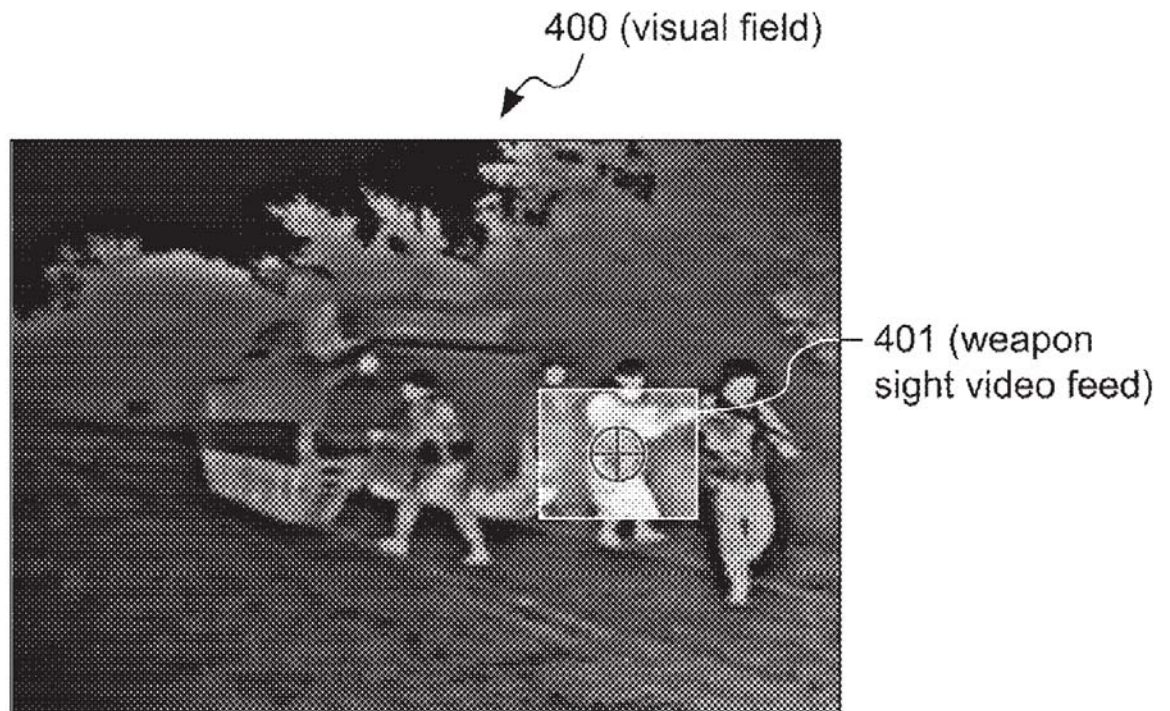


FIG. 4

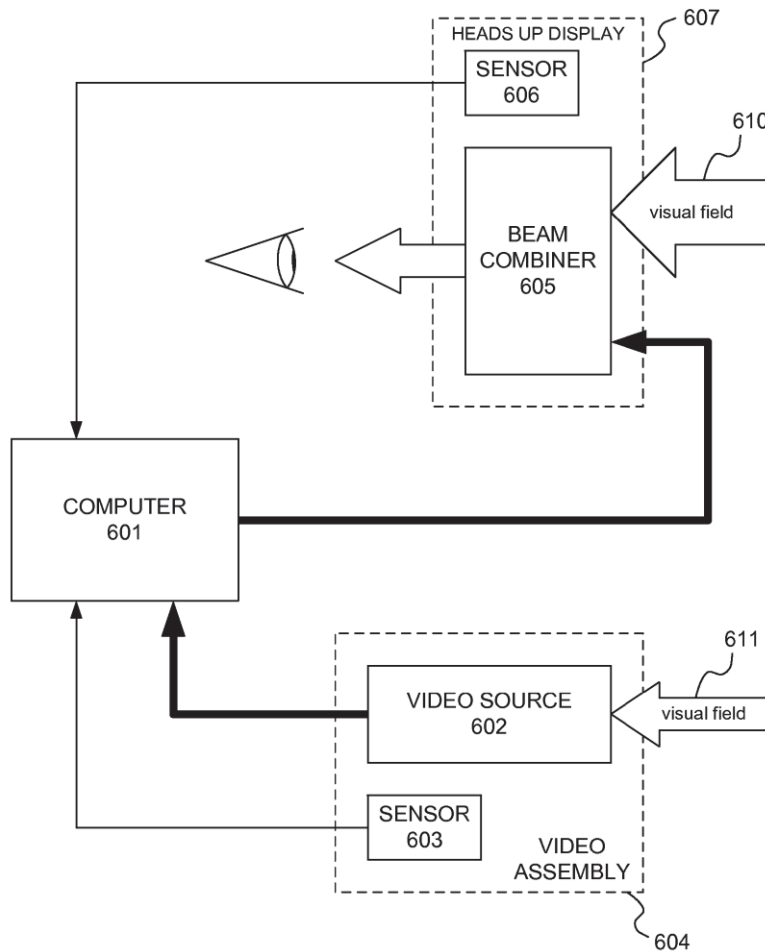


FIG. 6

Similarly, the later filed '230 and '752 patents are from the same patent family, share the same named inventors, and the same specification and drawings. The '230 patent family also generally claims systems and methods for using orientation data from sensors to overlay images, but this family also adds the technique of comparing video image data from the first and second images to aid in overlaying (in the case of the '230 patent) or replacing (in the case of the '752 patent) a portion of a first video image and a portion of a second video image.<sup>2</sup> *See, e.g.,* '230 patent, claims 1, 15, 29; '752 patent, claims 1, 7, 13. The later-filed '230 patent family shares a

<sup>2</sup>Although L3 describes the patented processes for purposes of its claim construction brief, it does concede that the claims of any of the asserted patents are enabled or sufficiently described as required by 35 USC § 112.



common inventor with the earlier filed '012 patent family (Mr. Scales) and incorporates the '012 patent application by reference. *See, e.g.*, '012 patent, 1:18-25.

#### IV. CONSTRUCTION OF “OVERLAY” AND RELATED TERMS

Term(s)	L3's Proposed Construction	SAIC's Proposed Construction
“Overlay” (including “overlays” and “overlying”)  '012, patent claims 1, 17; '103 patent, claim 1; '230 patent, claims 1, 15, 29	to place on top or in front of ( <i>e.g.</i> , superimpose)	Plain and ordinary meaning: <i>e.g.</i> , Overlaying (plain and ordinary meaning): positioned over or upon.  Overlay/overlays (plain and ordinary meaning): are over or upon/is over or upon

The terms “overlay” appears in the claims of the '012, '103, and '230 patents. In all instances, the terms “overlay” and “overlaid” are used consistently to describe something that is placed on top of, or in front of, something else, so that the two items are superimposed over each other. For example, in claim 1 of the '012 patent, a transparent display is overlaid, or placed in front of, the visual field of a user, so as to allow light to pass from the field to the user's eye. *See, e.g.*, '103 patent, Figs. 4 and 6; '103 patent claim 1; '012 patent, claims 1, 17. An image may further be overlaid onto the transparent display, such that the image is aligned with the same portions of the visual field that are seen through the display. *See, e.g.*, '012 patent, claims 1, 17, Figs. 4, 6; '103 patent, claim 1; '230 patent, claims 1, 15, 29.

Although SAIC's and L3's definitions are similar, L3 requests that the Court adopt its definition to make it clear that the concept of “overlying” in the patents is synonymous with superimposing, as the transparent display is superimposed over the visual field, and then the image is superimposed over the transparent display, so that both the image and the underlying visual field are both still evident to the user. This is the plain and ordinary meaning of overlay

and is consistent with the specifications of both patent families and dictionary definitions cited by both parties.

For example, the '012 patent family describes optically overlaying a video image over an optical field of view:

In addition, the video feed **401** has been positioned over the portion of the visual field **400** based on the direction the video source is pointed. As the weapon moves, the video feed **401** is dynamically positioned within the visual field **400**. Ultimately, by *superimposing* the two images, a soldier with a heads up display and a weapon mounted video camera is able to simultaneously survey a setting, acquire a target, and point his weapon at the target without taking time to shift from goggles to weapon sight.

'012 patent,<sup>3</sup> 3:64-4:6 (emphasis added); *see also, id.* at 7:36-40 (“As such, if the video source moves from left to right, then its orientation data will change, and subsequent displayed frames will move left to right across the visual field, aligning or registering each frame with the portion of the visual field it overlays”). When two images are overlaid in this manner, the patents refer to them as being superimposed on one another. *Id.* at 2:4-7, 3:64-4:6; '230 patent, 1:18-25; 4:13-16. The patent notes that the prior art similarly overlaid images:

They have the ability to port a video feed into a beam combiner, overlaying a video image from a video source mounted in the weapon sight onto the center of the visual field of the goggles.

An example of such a combined image appears as prior art FIG. 1. Here, the video feed 102 from a weapon's sight is superimposed directly into the center of the night vision goggle's visual field 101.

'012 patent, 1:67-2:7; *see also id.* at 2:50-51 (“Fig. 1 illustrates a prior art example of a stationary video feed overlaying a visual field.”).

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<sup>3</sup> Although L3 cites to the '012 patent specification throughout its discussion, the citations are also found in the '103 patent specification.

The patents describe the mechanism by which the image can be overlaid onto the transparent display by using a beam combiner. This arrangement is also known as a “heads up display” or HUD:

The processed video frame, at this point, may be displayed in a heads up display, as in step 809.... The displayed frame appears before a visual field from the perspective of an observer of the visual field. The calculated position and rotation orientation of the processed frame place it on the display approximately in front of the same subject matter depicted in the visual field.

*Id.* at 7:14-19.

Heads up display assembly **607** is composed of a beam combiner **605** and sensor **606** affixed to detect the orientation of the beam combiner. Beam combiner **605** has a visual field **610** whose image is combined with the processed video signal delivered from computer **601**. This combination of video signal with visual field may be created through the use of a transparent display, such as a piece of glass set at an angle. The glass may pass light from the visual field **610** to the observer while simultaneously reflecting light from a video display strategically placed based on the angle of the glass....

The video output of computer **601** is placed in front of the visual field **610**, creating what is sometimes referred to as a heads up display or HUD. Such displays allow an observer to receive information or images while simultaneously viewing a visual field, preventing the observer from having to look away.

*Id.* at 5:52-6:2.

The use of a HUD was a well-known display technique, as admitted at '012 patent, 1:62-66. By using the method of: 1) placing the transparent display in front of the user's visual field (*e.g.*, by overlaying it on the visual field), so that light may pass through it; and 2) projecting video images onto the transparent display, so that they appear in front of the visual field, a person using the systems and methods of the '012 patent family can see both images at the same time. SAIC's proposed “alternative” construction of overlay, “positioned over or upon”, fails to capture this aspect of the term “overlay” as it is used in the patents.

The '230 patent similarly claims and describes images as being overlaid on one another, so that one image is superimposed over the other. *See, e.g.*, '230 patent, claims 1, 15, 29, Figs. 4,

5B, 6B, 6D, 6F, 6H, 8A, 8B, 13A, 13B; 2:9-15 (“Once a location is selected (either a confirmed sensor-based location or a location found using image comparison) the two images are displayed such that the second image (or a portion of that image) overlays a corresponding portion of the first source image.”); 7:5-8 (“various graphical indicia are overlaid within HUD 73. Also overlaid on HUD 73 is a weapon view 74 corresponding to (and generated from) the scope image.”); 15:24-25 (“the resulting image is then overlaid on the goggles image as the weapon view (block 121)”).

Notably, the ’230 patent specifically incorporates the image overlaying techniques of the ’012 patent, which it refers to as superimposing an image:

Augmented reality systems have also been developed for use in a combat military environment. For example, commonly owned U.S. patent application Ser. No. 11/000,934 (filed Dec. 2, 2004, titled "System and Method for Video Image Registration in a Heads Up Display," published as Pub. No. US20060121993, [issuing as the ’012 and ’103 patents] and incorporated by reference herein) describes a system in which an image from a rifle-mounted video source is superimposed on an image seen through a pair of goggles.

’230 patent, 1:18-25. The ’230 patent describes its own overlaying techniques using similar terminology. *See, e.g. id.*, 4:13-16 (“As described in more detail below, this permits superimposition of an image from scope 17 onto display corresponding to a field of view of the goggles”).

Dictionary definitions, including definitions from dictionaries cited by SAIC itself, are in agreement with the understanding of the term “overlay” as used in the patents and as proposed by L3: “to place on top or in front of (e.g., superimpose).” *See, e.g.*, Ex. 1 at A04 (Merriam Websters’ Collegiate Dictionary) (overlay. Vt, 1a. To lay or spread over or across); Ex. 2 at A09 (New Penguin Dictionary of Computing) (overlay 1: In graphics, to superimpose one image over another); Ex. 3 at A13 (New Oxford American Dictionary) (overlay v. lie on top of: *a third*

*screen which will overlay the others.*); Ex. 4 at A17 and Ex. 5 at A21-22 (Newton’s Telecom Dictionary, Eds. 16-17) (overlay: 2. The ability to superimpose computer graphics over a live or recorded video signal and store the resulting video image on videotape. It is often used to add titles to videotape.). Because the patent specifications and the extrinsic evidence all contain the concept of “superimposing” one image over another, L3 asks that its claim construction be adopted by the Court.

#### V. CONSTRUCTION OF “TRANSPARENT DISPLAY” TERMS

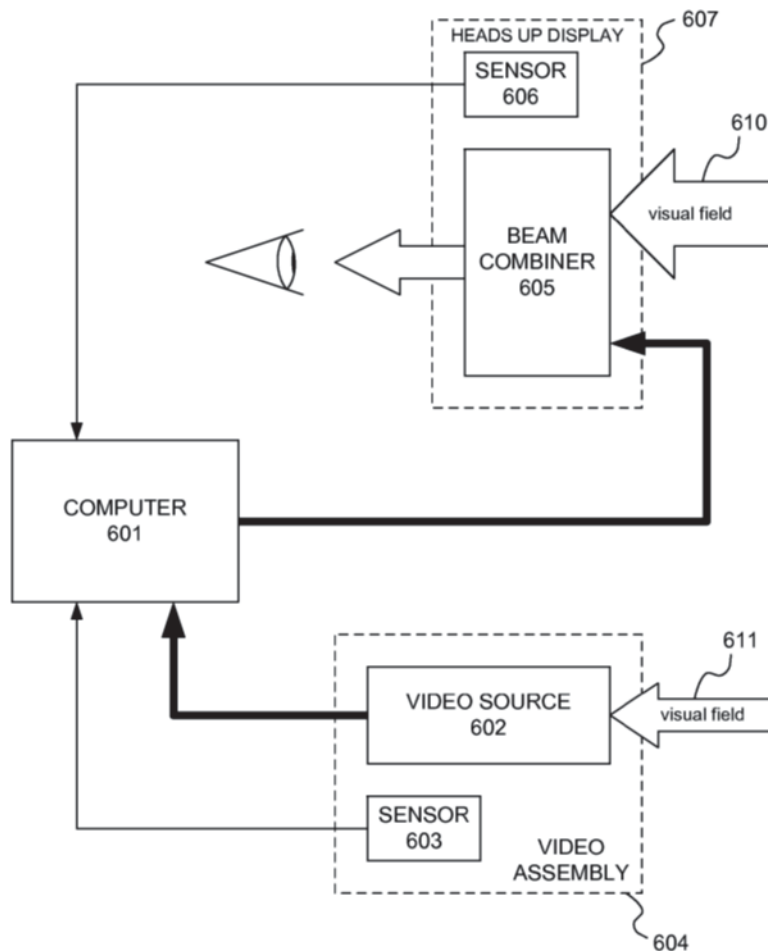
Term(s)	L3’s Proposed Construction	SAIC’s Proposed Construction
“a transparent display overlaying the visual field” <sup>4</sup>  ’012 patent, claims 1, 17	a display that allows light from the visual field to pass through it	a display that has the effect of being transparent or translucent, allowing simultaneous viewing of the underlying visual field and other images or information
“a heads up display adapted for viewing of the visual field by a user of the system wherein the HUD comprises a transparent display”  ’103 patent, claim 1	a heads up display adapted for viewing of the visual field by a user of the system wherein the HUD comprises a display that allows light from the visual field to pass through it	A heads up display adapted for viewing of the visual field by a user of the system wherein the HUD comprises a display that has the effect of being transparent or translucent, allowing simultaneous viewing the underlying visual field and other images or information.

As discussed above, the term overlay as used in the patents refer to something being placed in front of or superimposed over something else. Here, in the context of the entire phrases identified above, the phrase should be interpreted as meaning that the transparent display is placed in front of (*e.g.* between) the user and the user’s field of view, and the transparent

<sup>4</sup> SAIC previously construed this term. The Government construed “transparent display” only, with respect to both the ’012 and ’103 patents.

display allows light to pass directly from the visual field, through the display, to the user's eye.

*See, e.g., '012 patent, 2:31-37* (“A first embodiment of the invention provides a method for aligning video images with an underlying visual field by determining a source orientation of a video source, determining a display orientation of a transparent display overlaying the visual field, and displaying video images in the transparent display...”); 2:45-52. This is illustrated in Figure 6, and described in detail in col. 5:44-6:2 of the '012 patent:



**FIG. 6**

FIG. 6 is a block diagram which depicts the functional components of an illustrative embodiment of the invention. Here, computer **601** receives sensor data and a video feed from video assembly **604**, along with sensor data from heads up display assembly **607**. Video assembly **604** is composed of video source **602** and sensor **603** affixed to detect the orientation of the video source. Video source **602** has a visual field **611** from which it receives light and converts it to the video

signal delivered to computer **601**. Heads up display assembly **607** is composed of beam combiner **605** and sensor **606** affixed to detect the orientation of the beam combiner. Beam combiner **605** has a visual field **610**, whose image is combined with the processed video signal delivered from computer **601**. This combination of video signal with visual field may be created through the use of a transparent display, such as a piece of glass set at an angle. The glass may pass light from the visual field 610 to the observer while simultaneously reflecting light from a video display strategically placed based on the angle of the glass. The transparent display need not be perfectly transparent, but also might be translucent allowing only some light to pass through. The video output of computer **601** is placed in front of the visual field **610**, creating what is sometimes referred to as a heads up display or HUD. Such displays allow an observer to receive information or images while simultaneously viewing a visual field, preventing the observer from having to look away.

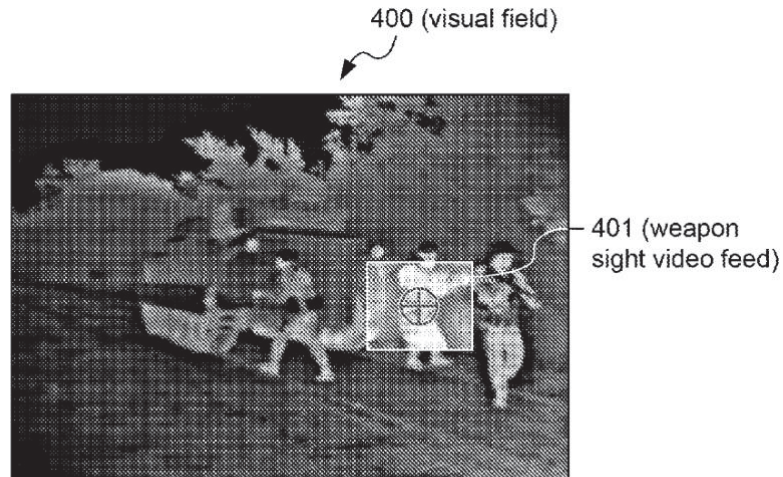
*Id.* (emphasis added). The placement of a transparent display between the user's eye and the field of view allows light to pass directly from the external field of view to the user's eye. Video images can then be overlaid on that field of view by placing them in front of the field of view.

*Id.*; *see also*, '012 patent, Fig. 4, 3:54-61 ("The visual field 400 of Fig. 4 illustrates the image produced by an illustrative embodiment of the invention. The visual field 400, here the view through the soldier's night vision goggles or other (clear) goggles, is enhanced with the addition of a portion of the weapon site video feed 401 through the use of a heads up display (HUD).")<sup>5</sup>

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<sup>5</sup> While SAIC, the Government and Microsoft stipulated to a definition of a "visual field" in the abstract, it is important to note that the claims here refer to "*the* visual field", and the use of the definite article "the" refers to the specific visual field that is described earlier in the claims. In each of the independent claims of the '012 and '103 patents, the visual field is the visual field of the video source (video camera in the case of the '103 patent), that provides data for a series of video images. *See, e.g.*, '012 patent, claims 1, 17; '103 Patent claim 1. Thus, "the visual field" described in step (2) of each of the claims is the same visual field that is seen by the video source/camera. *See, e.g.*, Fig. 6, claim 1.





**FIG. 4**

L3's definition is consistent with the other examples in the specification, which describes similar see through materials, such as glass and windshields. '012 patent, 5:25-26 ("For example, the heads up display could appear before a windshield in a vehicle."), 7:43-45 (describing HUD goggles).

The Government had construed the term "transparent display" to mean "optical see-through display, or a display that allows some light to pass through it (*i.e.*, is see-through) when powered off". ECF No. 63-1 at 10. SAIC argued that this construction was incorrect because it was based in part on extrinsic evidence. L3 believes that the Government's construction is in fact technically correct and consistent with the intrinsic evidence. L3 has offered its own construction, however, based on the same intrinsic evidence of the patent and the ordinary meaning of the claim terms, but which does not use phrases that SAIC complains are derived from extrinsic evidence.

Should the Court consider extrinsic evidence in construing this phrase, L3's definition is consistent with the extrinsic evidence, including the disclosures of the later '230 patent filed by the same named inventor, Mr. Scales, which specifically incorporates the '012 patent by



reference. '230 patent, 1:17-25. The '230 patent discusses known goggles that receive visual light from the visual field, and in which “[v]isible light passes from the goggles field of view through eyepiece and can be seen by the user.” '230 patent, 6:16-18. Contemporaneous dictionaries also demonstrate that, consistent with L3’s definition and the intrinsic evidence of the patent, the plain and ordinary meaning of “transparent” is something that allows light to pass through it so that objects on the other side can be seen through it. *See, e.g.*, Ex. 1 at A05 (Merriam Websters’ Collegiate Dictionary) (“transparent 1a. having the property of transmitting light without appreciable scattering so that bodies lying beyond are seen clearly: ...”); Ex. 6 at A26 (Wiley Electrical and Electronics Dictionary) (“transparent 1. A body, material or medium which freely passes radiant energy, such as light, or sound.”).

SAIC’s proposed construction of “a transparent display overlaying the visual field” — “a display that has the effect of being transparent or translucent, allowing simultaneous viewing of the underlying visual field and other images or information”— is flawed.

First, SAIC seeks to improperly broaden the claim term “transparent” to mean something “that has the effect of being transparent or translucent.” While broadening the phrase to include something that is “translucent” has support in the patent specifications, the phrase “has the effect of” is ambiguous, unsupported by the specification, and is clearly intended to impermissibly broaden the scope of the claims.

As explained above, the transparent display described in the '012 and '103 patents allows simultaneous viewing of the underlying visual field because it allows the light from the underlying field to pass through it to the user’s eye. *See, e.g.*, '012 patent, Fig. 6, 5:44-6:12. SAIC’s construction invites mayhem into the process since displays which are clearly not transparent, such as ordinary LED screens, can be said to “have the effect” of being transparent if

a certain scene is placed on them. Consider a large screen television which plays the scene of burning logs and flames. Although this mimics a transparent piece of glass set in front of a fireplace, one cannot say that the large screen TV is “transparent”. However, under SAIC’s construction, it arguably is. In order to remove any ambiguity, the Court should refrain from incorporating phrase such as “has the effect of” into constructions unless it is expressly supported by the specification. In this instance, SAIC cannot point to any such support, as there is none.

#### VI. CONSTRUCTION OF “DATA FROM VIDEO SOURCE IMAGES” TERM

Term(s)	L3’s Proposed Construction	SAIC’s Proposed Construction
“based on a comparison of data from the first and second video source images”  '230 patent, claims 1, 15, 29	based on the comparison of image data ( <i>e.g.</i> , content and contrast) from the first and second video source images	Plain and ordinary meaning

An important difference between the '012 patent family and the later '230 patent family is the manner in which the images from the weapon sight (first video source) and the night vision goggles (second video source) are aligned. The '012 patent family claims a system in which the images from two different sources are aligned using only orientation data. *See, e.g.*, '012 patent, claims 1, 17; '103 patent, claim 1. By the time the '230 patent was filed three years later, however, the named inventors had realized that use of orientation data alone may pose problems. *Id.*, 1:35-43 (identifying disadvantages of system using only sensor data to match images). Thus, the later-filed '230 patent describes an improved two-step alignment method, which first uses data from motion sensors to help align images from two different sources, and then performs a

second step of comparing of the content of the images themselves, and using that comparison to evaluate whether the alignment is correct, and/or to adjust the alignment as necessary:

Data from the two images are then compared in order to evaluate the location determined from the sensor data. The sensor-based location is either confirmed, or a new location is found based on additional image comparisons. Once a location is selected (either a confirmed sensor-based location or a location found using image comparison) the two images are displayed such that the second image (or a portion of that image) overlays a corresponding portion of the first source image. Locations obtained using image comparisons are used to calibrate (adjust) the manner in which subsequent sensor-based locations are determined.

'230 patent, 2:6-17.; *see also, id.* at Abstract ("The sensor-based location is checked (and possibly adjusted) based on a comparison of the images."); 2:58-62 ("FIGS 8A-8K illustrate checking and/or correcting an IMU-based position for one video image within another video image. FIGS. 9A-9C illustrate correction of an IMU-based position calculation based on image comparison results."); 7:19-22 ("As discussed below, the location and rotation of weapon view 74 within user display 70 is determined by computer 30 based on output from sensors 13 and 18 and based on comparison of the scope image with the goggles image."); 9:45-47 ("for larger distances, image comparison position calculations (described below) compensate for errors caused by parallax."); 10:5-16 ("In block 117, the IMU-based calculation for position and rotation of weapon view 74 within display 70 is checked using an image-based method....").

The distinction between orientation data and image data is illustrated by claim 1 of the '230 patent:

A system, comprising:

a first video source configured to generate images representing portions of an external environment;

a second video source, movable independent of the first video source, configured to generate images representing portions of the external environment;

a video display; and

a controller coupled to the first and second video sources and to the display, wherein the controller is configured to

- (a) receive video images from the first video source and from the second video source,
- (b) **receive motion data indicative of motion of the first and second video sources,**
- (c) identify, based on the received motion data, a part of a first video source image that potentially represents a portion of the external environment represented in a part of a second video source image;
- (d) **evaluate, based on a comparison of data from the first and second video source images,** the identification performed in operation (c); and
- (e) display at least a portion of the first video source image and at least a portion of the second video source image such that the second video source image portion overlays a corresponding region of the first video source image portion, wherein the corresponding region represents a portion of the external environment represented in the second video source portion.

In steps (a) and (b), the system controller receives images from the first and second video sources, and separately receives motion data from sensors mounted on the video sources that reflect their relative motion. In step (c), the motion data received in step (b) is used to identify portions of the first video images that are likely to represent the same portion of the external environment as portions of the second video image. In step (d), the one that is the subject of this construction, the controller uses data “from the first and second video source image” received in step (a) to evaluate the identification previously performed using the separately claimed “motion data indicative of motion.” As described in the specification, this image comparison is based on a comparison of the data from the images themselves, not orientation data.

L3 proposes its construction merely to make it clear that image data, as used in the claims, is distinct from orientation data. To date, SAIC has not voiced any opposition to this, other than to state that the “plain and ordinary meaning” of the claim term should be used. To avoid any future uncertainty, L3 asks that the Court construe this term. The distinction L3 seeks to make between image data and orientation data is detailed in the ’230 patent specification, as it

describes numerous possible image comparison methods and algorithms that may be employed, including comparing for example, grayscale<sup>6</sup> data of images, peak-to-sidelobe “PSR”), and contrast. *See also, id.* at 10:21-26 (“To address these concerns, the relative orientation of goggles 11 and scope 17 can be independently deduced by processing image data from image generator 57 and scope 17 if there is sufficient image content and contrast and if similar imaging technologies (e.g. microbolometers, CCD, etc.) are used.”); 3:1-5 (“FIGS 13A and 13B show a goggles images and scope image, respectively, used to describe an alternative image comparison algorithm. FIG. 14 is a flow chart for an alternative image comparison algorithm”); 10:47-15:21; 18:38-0:11; Figs. 14. While the methods of comparing images can vary, they all have one thing in common—they are based on the content of the images—*e.g.*, what the image itself actually shows—such as the contrast or brightness at certain locations. *Id.*; *see also* claims 3, 5-10, 17, 19-24, 33, 35-37. These techniques are all distinct from techniques using “orientation data.”

## VII. CONSTRUCTION OF “VIDEO SOURCE AND VIDEO IMAGES” TERMS

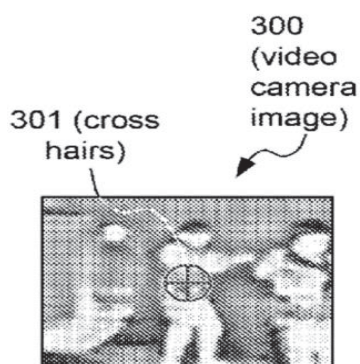
Term(s)	L3 and the Government’s Proposed Construction	SAIC’s Proposed Construction
“video images”/“video source image” / “video data of images”  ’012 patent, claims 1, 2, 6, 8, 9, 12,14, 17, 19; ’103 patent, claims 1, 4, 9; ’230 patent, claims 1, 3, 4, 5, 7, 9, 10, 13, 15, 17, 18, 19, 21, 23, 24, 27, 29, 31, 32, 33, 35, 37, 38, 41 ’752 patent, claims 1, 2, 7, 8, 13, 14	digital or analog video frames	“video images”/“video source image” mean [Images][An image] generated from visual information (e.g., visible light, ambient light, thermal/IR data, etc.) captured from a video source, depicting an external area or region in the video source’s field of view  Where “video source” and “field of view” each has the meaning proposed at the row herein

<sup>6</sup> Grayscale refers to the brightness (*i.e.*, amount of light) of a particular location, such as a pixel, without regard to color.

		where the term is identified as a Proposed Term for Construction.
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L3 and the Government construe “video images,” “video source images” and “video data of images” as “digital or analog video frames.” This construction is simple and captures the descriptions made in the claims and specifications of the ’012 and ’230 patents, and the distinctions made during the prosecution of the ’230 and ’012 patents. To be broken into frames (e.g. individual images), visual information captured by a video source must be converted into electrical signals or data. Indeed, this is the ordinary definition of video. By contrast, SAIC’s definition fails to define what “video” means so that SAIC can argue down the road for a broader scope of the claim that encompasses non-video images (such as optical images) that both SAIC and the Patent Office clearly distinguished from video images during prosecution. This is improper.

As the Government explained in its briefing, the patents equate video images with still video frames. *See, e.g.*, ’012 patent, 6:25-37, 6:44-7:42, Fig. 3; ’230 patent, Figs. 5A, 5B, 6B, 6D, 6F, 6H, 8B, 8H, 13A, 13B, 14, 17A-17B.



**FIG. 3**

In the specification of the '012 patent, for example, the patent owner describes the method of registering a video images with an underlying visual field as involving registering individual video frames with the underlying field:

FIG. 8 demonstrates an illustrative embodiment of a method for registering a video image with an underlying visual field. . . Once initiated, at step **802**, a video frame is received for processing. The frame may be processed digitally, and if it is received in analog form may first need to be converted to a digital format for processing.

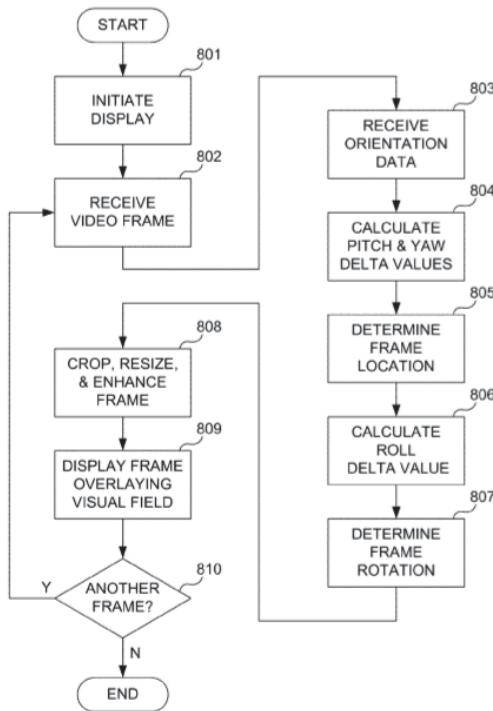


FIG. 8

'012 patent, Fig. 8, 6:25-37; *see also*, 6:44-7:42 (describing processing of video frame in more detail). Each still frame is individually processed, and (in the case of the '012 patent), positioned and oriented based oriented based on sensor data:

At this point in the process, at decision **810**, if another frame of video is set to be received (i.e., the display is still on), then the process repeats for each new frame, returning to step **802**. In this fashion, each frame of video is individually processed, modifying the frame, positioning and rotating it based on the difference in orientations between the video source and the display, and then displaying it.

*Id.* at 7:30-36. Notably, while the video sources (including video cameras) are described and claimed in the '012 and '103 patents as providing video images, the underlying visual field, which merely passes through the transparent display as described in the '012 patent (*see, e.g., id.*

at FIG. 6, 5:44-6:2); is not described as a video image or frame in either the specification of the claims of the '012 or '103 patents. *See, e.g.*, '103 patent, claim 1; '012 patent, claims 1, 17.

The Government and L3's position is consistent with dictionary definitions of "video":

Video 1. Consisting of, or pertaining to images or sequences of images presented via a display device such as a TV, computer monitor, radar or cell phone. The term usually includes any audio accompanying said images. **Video consists of true motion which is divided into still frames...** 3. Pertaining to, utilizing, or resulting from signals at video frequencies. 4. **Data which is in a format suitable for displaying images or sequences of images via a device such as a computer monitor.**"); *Id.* at p.838 ("video camera 1. A device that converts images formed by lenses into electrical signals....")

Ex. 6 at A28 (Wiley Electrical and Electronics Dictionary) (emphasis added).

Further, L3 and the Government's construction is confirmed by the prosecution histories of the patents. During the prosecution of the '230 patent, both the patent owner and the Patent Office made it clear that not all images are "video images," and that optics which merely pass an image through to the eye do not generate video images. In particular, the patent owner appealed a final rejection made by the Patent and Trademark Office based on a prior art patent to Azuma. The patent owner argued that Azuma did not overlay on video image upon another, because one of the "images" was merely optical, and did not qualify as a video:

Azuma is directed to a system in which the user views the external world through an optical device (e.g. modified binoculars) and graphical information is superimposed on that view of the world. *Id.*, ¶¶ 002, 0012, 0061. Azuma is not directed to a system in which one video stream is overlaid on another video stream.

Ex. 7 at A34 (Prosecution History Excerpts, '230 patent, Appeal Brief).

The Patent Office agreed with this argument and the distinction between optical images and video images, and reversed the rejection made by the Examiner, resulting in allowance of the patent. "Although Azuma's optical *display* may generate optical images, the disputed limitation of a video source, when read in light of the Specification, must generate *video* images, e.g.



electrical signals or data.” Ex. 7 at A63 (Prosecution History Excerpts, ’230 patent, Decision on Appeal).

SAIC’s definition of “video images” suffers from several flaws. First, the definition is not helpful. Rather than defining what it actually mean to be a “video”, SAIC’s proposed construction of “video images” defines a video image based on its definition of “video source”, which in turn defines a video source as something that creates “video images” and refers back to its definition of video images. But this circular definition fails to define what “video” actually means, and may only lead to further disputes among the parties down the road. Having argued that its claims directed to “video images” do not include optical “images” that are merely passed through to the eye, and which are not converted into electrical signals or data (e.g. into frames), SAIC cannot argue for a broader construction that would encompass optics. *SanDisk Corp. v. Memorex Prod., Inc.*, 415 F.3d 1278, 1286 (Fed. Cir. 2005) (explaining that prosecution history disclaimer precludes patentees from recapturing through claim interpretation specific meanings disclaimed during prosecution); *Elbex Video, Ltd. v. Sensormatic Elec. Corp.*, 508 F.3d 1366, 1371 (Fed. Cir. 2007) (explaining the public is entitled to rely on definitive statements made during prosecution).

#### **VIII. INDEFINITENESS OF REGISTRATION TERMS**

<b>Term(s)</b>	<b>L3 and the Government’s Proposed Construction</b>	<b>SAIC’s Proposed Construction</b>
“in registration with”  “registering”  “wherein boundaries of the displayed video images are in registration with boundaries of portions of the visual field represented by the displayed video images”	Indefinite.	“in proper alignment and position, so as to coincide and not be substantially offset”  “wherein boundaries (e.g., outer edges) of the displayed video images are in proper alignment and position so as to coincide with and not be

“registering the portion of the video feed with the underlying visual field”  ’012 patent, claims 1, 17; ’103 patent, claims 1; ’230 patent, claims 3, 17, 31; ’752 patent, claims 1, 7, 13		substantially offset from boundaries (e.g., outer edges) of portions of the visual field represented by the displayed video images.”
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Each of the asserted patents requires some form of the concept of registration, whether it be “registering” images or placing one image “in registration with” another. L3 agrees with the government that the claim terms above relating to “in registration with” and “registering” used in the ’230 and ’012 patent families are indefinite because a person of ordinary skill in the art could not determine their objective scope with reasonable certainty.<sup>7</sup> *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014), on remand, 783 F.3d 1374 (Fed. Cir. 2015). For example, “[t]he intrinsic evidence does not contain any criteria or other description by which to measure or know when [the claim term] ‘wherein the boundaries of the displayed images are in registration with boundaries of portions of the visual field represented by the displayed images.’” ECF. No. 66, Neumann Decl., ¶¶ 53-57. SAIC’s expert, Dr. Welch, admits that the registration is never perfect, and that the patents do not describe what is an acceptable offset. ECF No. 79-2 at 169:8-25, 170:9-18. This is particularly troubling because the parties dispute that different registration methods will lead to different results. *Id.* at 212:4-16; *see also, Teva Pharmaceuticals, USA Inc. v. Sandoz, Inc.*, 789 F.3d 1335, 1338 (Fed. Cir. 2015) (on remand from Supreme Court, holding claims invalid for “indefiniteness” based on claim term “molecular weight of about 5 to 9 kilodaltons,” where “molecular weight” can be measured in three different ways to get different results).

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<sup>7</sup> L3 agrees with the government’s indefiniteness arguments as more fully laid out in the government’s claim construction briefs, for example, at ECF No. 89 pp. 39-42.

While the '230 patent provides an express definition of the term “register,” that does not mean that the term is sufficiently definite to satisfy 35 U.S.C. § 112. *See, e.g., Halliburton Energy Svcs, Inc. v. M-I LLC*, 514 F.3d 1244, 1251 (Fed. Cir. 2008) (“Even if a claim term's definition can be reduced to words, the claim is still indefinite if a person of ordinary skill in the art cannot translate the definition into meaningfully precise claim scope.”). Where, as here, a term is defined in the specification, but that definition is itself unclear in scope, the term is still indefinite. *Id.*

Col. 10, lines 11-15 of the '230 patent define the term registration:

As used herein, “registration” refers to positioning of a scope image (or portion of that scope image) within a goggles image so that the two images are properly aligned and positioned, and one image coincides with the other.

This definition is in and of itself, indefinite, because it uses subjective terminology to define the concept of registration, without providing sufficient guidance or examples to define the scope.

*See, e.g., Interval Licensing LLC v. AOL, Inc.* 766 F3d 1364 (Fed. Cir. 2014) (affirming indefiniteness of display “in an unobtrusive manner that does not distract a user” as “highly subjective” and with only a “hazy relationship” with the written description; claims must provide “objective boundaries”); *Datamize, LLC v. Plumtree Software Inc.*, 417 F.3d 1342 (Fed. Cir. 2005) (finding the term “aesthetically pleasing” indefinite). What is “proper” alignment and positioning is not described with clarity, and in fact may well depend on the perspective of a particular application or user, the method of registration used, and the needs and precision required by the particular use in which she is engaged. *See, e.g., Dkt. 79-2, Welch Dep.* at 169:8-25, 170:9-18, 212:4-16.

This subjectivity is important, because it underlines the public notice function of the patents. The claims, when read in light of the specification and the prosecution history, must

provide objective boundaries of the protected information that can be discerned by those of skill in the art. *See Nautilus*, 572 U.S. at 910; *Geneva Pharm., Inc. v. Glaxosmithkline PLC*, 349 F.3d 1373, 1384 (Fed. Cir. 2003) (“A claim is indefinite if its legal scope is not clear enough that a person of ordinary skill in the art could determine whether a particular composition infringes or not.”). Where, as here, the claims utilize subjective terminology and provide no objective criteria for assessing the scope of the subjective terms, any reasonable certainty is lost. A person of ordinary skill in the art would not be able to determine with reasonable certainty when alignment is “proper” and images coincide with one.

Indeed, SAIC is aware of this flaw and seeks to modify the definition of registration that is found in the '230 patent's specification, by re-defining “registering” and “in registration with” as “in proper alignment and position, so as to coincide and not be substantially offset.” *See* ECF No. 63-1 (emphasis added to show the modification of the definition in the specification). But SAIC's proposed modified definition does not cure the ambiguity. This proposed construction uses the same subjective terminology, asking whether the alignment is “proper,” and further introduces a new potential ambiguity, the phrase “not be substantially offset.” As noted above, its expert admitted the patent does not state how much offset is permissible. ECF No. 79-2 at 170:9-18.

## **IX. CONCLUSION**

For the foregoing reasons, the Court should adopt L3's proposed constructions, and reject SAIC's overbroad and improper constructions.

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**CERTIFICATE OF SERVICE**

I hereby certify that, pursuant to RCFC 5, the foregoing **L3 Technology, Inc.’s Opening Claim Construction Brief** has been served electronically on all counsel of record for SAIC, the U.S. Government, and Microsoft Corporation on October 30, 2020.

/s/ William C. Bergmann  
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